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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,179	10/31/2001	Tadaharu Watanabe	MTG009	4094

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EXAMINER

MEDINA SANABRIA, MARIBEL

ART UNIT

PAPER NUMBER

1754

DATE MAILED: 06/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/003,179

Applicant(s)

WATANABE ET AL.

Examiner

Maribel Medina

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25, 27, 30, 32-37 and 41-66 is/are rejected.
- 7) ☒ Claim(s) 26, 28, 29, 31 and 38-40 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

#### **Oath/Declaration**

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: It does not identify the citizenship of each inventor. (Additional inventor Dan Fraenkel)

#### **Claim Objections**

2. Claims 49 and 66 are objected to because of the following informalities:
  - a. In claim 49, first line after "wherein", --the-- should be inserted.
  - b. In claim 66, fourth line, after "form" (first occurrence), --of-- should be inserted.

Appropriate correction is required.

#### **Claim Rejections - 35 USC § 112**

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 10, 13, 47-65 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. Claim 10 is indefinite for use of improper Markush language. The phrase that reads "selected from the group consisting of an oxide, a salt, an acid, an organic complex, or an inorganic complex of said metal" is confusing and renders the claim

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indefinite. The phrase should be changed to --selected from the group consisting of an oxide, a salt, an acid, an organic complex, [or] and an inorganic complex of said metal--.

b. Claim 13, recites the limitation "said precursor is heated under a flow of hydrogen" this limitation render the claim indefinite, since claim 9, recites that the precursor is heated under a flow of nitrogen. There is no antecedent in claim 9 for the use of hydrogen in claim 13.

c. Claim 47 recites the limitation "said metal". There is insufficient antecedent basis for this limitation in the claim. The limitation should be changed to --[said] a metal--.

d. Claim 55 recites the limitation "said metal". There is insufficient antecedent basis for this limitation in the claim. The limitation should be changed to --[said] a metal--.

e. Claim 61 recites the limitation "said metal". There is insufficient antecedent basis for this limitation in the claim. The limitation should be changed to --[said] a metal--.

f. Claim 65 recites the limitation "said metal". There is insufficient antecedent basis for this limitation in the claim. The limitation should be changed to --[said] a metal--.

**Claim Rejections - 35 USC § 102 and Claim Rejections - 35 USC § 103**

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-6, 14-24, and 47-65 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,976,944 (Pacaud et al).

In regards to claims 1 and 47, Pacaud et al disclose a method for the removal of impurities from a silane-containing gaseous stream. The method comprises contacting the gaseous stream with a purifier material to reduce the level of contaminants to less than 10 ppb (See col. 1, lines 10-23). The purifier material comprises a support having metallic copper deposited thereon (See col. 2, lines 30-32 and lines 52-54).

In regards to the limitation of claims 2, 19, 21, 50, 57, 61, and 65 that reads "wherein the oxidation state of said metal of said purifier thin layer is lower than the maximum oxidation state of said metal" Pacaud et al disclose that the copper is metallic copper (See col. 2, line 54), metallic copper is the zero oxidation state of copper, therefore this is an oxidation state lower than the maximum oxidation of copper.

In regards to the limitation of claims 3, 20, 22, 51, 58, and 62 that reads "wherein said thin layer of said purifier material further contains said metal in a zero oxidation state" Pacaud et al disclose that the copper is metallic copper (See col. 2, line 54), metallic copper is the zero oxidation state of copper.

In regards to claims 4, 52, 59 and 65 Pacaud et al disclose that the metal is copper (See col. 2, lines 30-33).

In regards to claims 5, 53, and 60, Pacaud et al disclose that the support may be any of silicoaluminates, titania, zirconia, alumina, silica and the like (See col. 2, lines 44-46).

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In regards to claim 6, Pacaud et al disclose the removal of contaminants form silane containing gaseous streams.

In regards to claim 16, Pacaud et al disclose in col. 2, lines 52-54 a cooper concentration in the range from 3-15 % by weight.

In regards to the limitation of claims 14, 15, 17, 18, 23, 24, 48, 49, 55, 56, 63, 64, and 65, Pacaud et al disclose a surface area in the rang of 30 to 600 m<sup>2</sup>/g.

In regards to claim 54, Pacaud et al disclose in col. 3, lines 23-26 that the material can be regenerated.

No difference is seen between the instantly claimed invention and Pacaud et al.

8. Claims 41-46 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Patent No. 4,976,944 (Pacaud et al).

Pacaud et al disclose a purifier material comprising a support having metallic copper deposited thereon (See col. 2, lines 30-32 and lines 52-54).

In regards to claim 44 Pacaud et al disclose that the copper is metallic copper (See col. 2, line 54), metallic copper is the zero oxidation state of copper, therefore this is an oxidation state lower than the maximum one.

In regards to claim 46, Pacaud et al disclose in col. 3, lines 23-26 that the material can be regenerated.

In the event any differences can be shown for the product of the product by process claims 41-46, as opposed to the product taught by Pacaud et al, such differences would have been obvious to one of ordinary skill in the art as a routine modification of the product in the

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absence of a showing of unexpected results; see also *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

9. Claims 1-3, 5, 8-13, 21, 22, 25, 27, 30, 32, 33, 35, 36, 37, 41, 44, 45, 46, 47, 50, 51, 53, 54, 61, 62, and 66 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,637,544 (Shadman).

In regards to claims 1, 21, 41, 47, and 61 Shadman discloses a method for removing contaminants from a silane or reactive gas stream comprising contacting the gas stream with a purifier material in order to reduce the levels of contaminants to parts per billion (See col. 1, lines 21-29). The purifier material comprises a substrate having deposited thereon one or more reduced forms of a metal oxide (See col. 2, lines 25-31).

In regards to the limitation of claims 2, 21, 32, 44, 50, 61, and 66 that reads "wherein the oxidation state of said metal of said purifier thin layer is lower than the maximum oxidation state of said metal" Shadman discloses that the term "reduced" as used in his invention "relates to the oxidation state of the metal in that the oxygen is present in less than the stoichiometric amount in the metal oxide (i.e., the metal species is partially or substantially deoxygenated)" (See col. 5, lines 3-15).

In regards to the limitation of claims 3, 22, 33, 45, 51, and 62 that reads "wherein said thin layer of said purifier material further contains said metal in a zero oxidation state" Shadman discloses "the metal species is partially or substantially deoxygenated" (See col. 5, lines 3-15), "substantially deoxygenated has been interpreted as being the zero oxidation state of the metal.

In regards to claims 5, 35, 53, and 60, Shadman discloses that the support may be any of Titania, zirconia, and alumina (See col. 4, lines 1-5).

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In regards to claims 8 and 37 Shadman discloses that the contaminants removed are among others are oxygen and moisture (See col. 1, lines 21-27).

In regards to claims 9, 25 and 66, Shadman discloses a method for preparing a purifier material comprising the steps of: a) providing a precursor of metal deposited on a substrate, wherein the metal may be oxidized or deoxygenated (see col. 5, lines 20-23); b) heating the precursor under a flow of inert gas such as nitrogen at a temperature range up to 200°C (See col. 5, lines 62-67); c) treating the substrate from step b) with a reducing agent to thereby produce the purifier material (See col. 6, lines 1-35).

In regards to claim 10, Shadman discloses that precursor may be an oxide of the metal (See col. 5, lines 29-30).

In regards to claim 11, Shadman discloses the use of vapor deposition (See col. 5, lines 24-26).

In regards to claims 27, Shadman discloses the use of 2 to about 35 % by weight of hydrogen the rest being an inert gas (See col. 6, lines 27-33).

In regards to claims 46 and 54, Shadman discloses in col. 8, lines 37-49, that the purifier material may be regenerated.

No difference is seen between the instantly claimed invention and Shadman.

10. Claims 7 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shadman.

Shadman applies here in as above.

In regards to claim 7, Shadman fails to disclose or exemplified his invention that the reactive gas treated is one selected from the group consisting of trimethyl aluminum, trimethyl



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gallium and trimethyl indium. Shadman discloses that this method may be used to treat reactive gases generated in semiconductors process. It would have been obvious to one of ordinary skill in the art at the time the invention was made to treat gases containing the above cited gases since this are common gases in semiconductors processes. On e of ordinary skilled din the art would have been motivated to treat any reactive gases generated in semiconductor process in order to remove moisture and oxygen contaminants.


In regards to claim 34, Shadman fails to disclose the metals cited in claim 34. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used as the active meal any of the cited metals, since Shadman discloses in col. 5, lines 15-20 that any metal capable of reacting with trace impurities may be used.


**Allowable Subject Matter**

11. Claims 26, 28-29, 31 and 38-40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Conclusion**

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner Maribel Medina. The examiner can normally be reached on Monday through Friday from 7:30 AM to 3:30 PM. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Examiner: Maribel Medina   
Tel: 703-305-1928  
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May 30, 2003

  
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